Pathological Complete Response in early stage HER-2 positive Breast Cancer patients, receiving neoadjuvant chemotherapy/Trastuzumab, in a single breast unit in Johannesburg

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Background

- Breast cancer is the most common newly diagnosed cancer in women in South Africa, making up 21.78% of new cancer diagnoses across all race groups, with an incidence of 33.35 per 100 000 [1]
- In sub-Saharan Africa, breast cancer is the second leading cause of cancer related death in women [2]
- Up to two thirds of breast cancer related deaths are estimated to occur in low- and middle- income countries due to late presentation and inadequate access to treatment (Saxena et al 2012) [3]
- HER-2 positive breast cancers receiving neoadjuvant therapy containing Trastuzumab show higher rates of pCR
- Trastuzumab is not available in the neoadjuvant setting in the public healthcare system in South Africa.

Aim

Evaluate factors affecting pCR in early stage HER-2 positive breast cancers from a single accredited multidisciplinary unit in Johannesburg, South Africa

Methods

- We retrospectively analysed data of 102 patients with early stage HER-2 positive breast cancer who received neoadjuvant trastuzumab/chemotherapy. We analysed the entire cohort for the total pCR, as well as looking at factors that may affect pCR (tumor size, menopausal status, hormone receptor status, Ki 67 levels and nodal status).

Results

The pCR for the entire cohort was 58.8%.

Factors associated with a higher pCR (univariate analysis)

Figure 1a. Tumor Size.

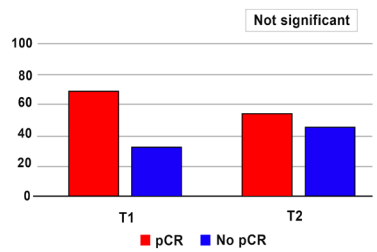


Figure 1b. Menopausal Status.

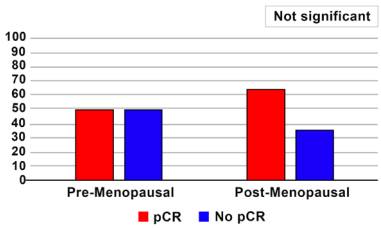


Figure 1c. ER Status.

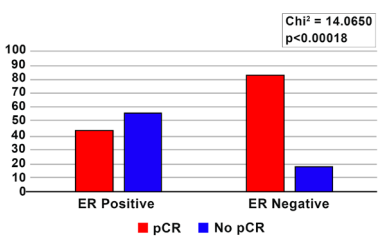


Figure 1d. PR Status.

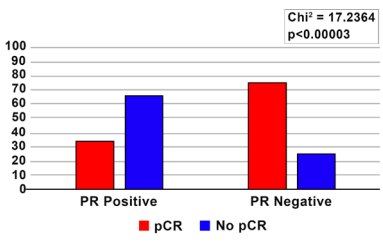


Figure 1e. Nodal Status.

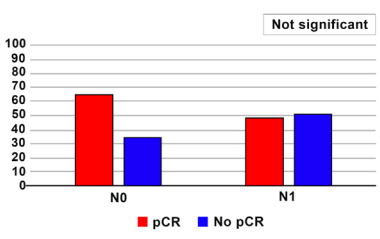
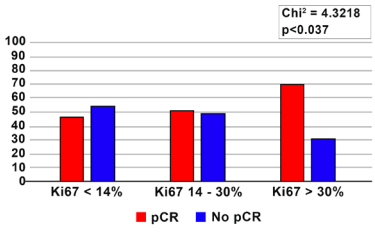


Figure 2. Ki67.



ER/PR/Her-2 Grouping (Multivariate Analysis)

There was a significant difference in pCR in relation to the ER/PR/Her-2 grouping.

The total pCR rate in our study was 58%. This compares well with international literature, showing rates of 60% and more (Buzdar et al 2005)[4]. Her-2+/HR- and Her-2+/HR+ breast cancers appear to be biologically distinct in terms of their disease profile (Li et al., 2018) [5].

Our data supports these findings. We found a 82.05% rate of pCR in HER 2 + ER- cancers, and a rate of 75.41% in HER 2 + PR – cancers, which were found to be statistically significant. Our multivariate analysis further went to illustrate this point in showing that the HER-2 enriched subtype of cancers attained statistically significantly higher rates of pCR than the ER/PR+ or Triple positive subgroups.

With regards to Ki 67 scores (low <14; intermediate 14-30; high >30) pCR was observed in 15% of cancers with low Ki 67, 51.11% in cancers with intermediate Ki 67 and 70.45% in cancers with high Ki 67 values, which was found to be statistically significant. This is in keeping with a study by Alba et al 2016 [6].

Conclusions

This data highlights the importance of molecular subtyping and Ki67 scores of early stage HER-2 breast cancers as a potential means predicting pCR. Our data is in keeping with the international standard of care for HER-2 positive breast cancers, as HER-2 enriched subtypes attained a higher pCR rate than the other subtypes. Currently Trastuzumab in not readily available in the public healthcare sector.

This study emphasises the need for Trastuzumab to be made available to all patients with HER-2 positive breast cancers in the neoadjuvant setting in South Africa.

References

[1] Cancer in South Africa Full Report 2014. National Cancer Registry. National Institute for Communicable Diseases http://www.nicd.ac.za/centres/national-cancer-registry/

[2] Dickens C, Duarte R, Zietsman A, Cubasch H, Kellett P, Schüz J, Kielkowski D and McCormack V (2014) Racial Comparison of Receptor-Defined Breast Cancer in Southern African Women: Subtype Prevalence and Age–Incidence Analysis of Nationwide Cancer Registry Data. Cancer Epidemiol Biomarkers Prev 23: 2311-2321

[3] Saxena N, Hartman M, Bhoo-Pathy N, Al E (2012) Breast cancer in South East Asia: comparison of presentation and outcome between a middle income and a high income country. World J Surg 36:2838–2846

[4] Buzdar, A.U., Ibrahim, N.K., Francis, D., Booser, D.J., Thomas, E.S., Theriault, R.L., Pusztai, L., Green, M.C., et al. 2005. Significantly higher pathologic complete remission rate after neoadjuvant therapy with trastuzumab, paclitaxel, and epirubicin chemotherapy: Results of a randomized trial in human epidermal growth factor receptor 2-positive operable breast cancer. Journal of Clinical Oncology. 23(16):3676–3685. DOI: 10.1200/JCO.2005.07.032.

[5] Li S, Wei W, Jiang Y, Li Q, Huang Q, Yang H and Liu J (2018) Comparison of the efficacy and survival analysis of neoadjuvant chemotherapy for Her-2-positive breast cancer. Drug Design, Development and Therapy 12: 3085-3093

[6] Alba, E., Lluch, A., Ribelles, N., Anton Torres, A., Sanchez Rovira, P., Albanell, J., Calvo, L., García Asenjo, J.A.L., et al. 2016. High Proliferation Predicts Pathological Complete Response to Neoadjuvant Chemotherapy in Early Breast Cancer. The Oncologist. 21(2):150–155. DOI: 10.1634/theoncologist.2015-0312.

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